

Resilience: Preventing and Preparing For The Worst



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This thought piece is designed to provide pragmatic assistance to politicians, regulators and board members by giving them the right questions to ask about whether water supply is resilient against events of magnitude that threaten the safe and reliable supply of water to people and businesses.

Resilience seems to mean different things to different people.

In this thought piece we unfairly pick on some recent publications to highlight how narrow perspectives on resilience can be. Then we attempt to provide a comprehensive and coherent framework.

Note that our scope intentionally omits financial resilience; our focus is purely operational.

It means having enough supply in all circumstances.

This seems to be the view of the civil engineers. Well, it would be, wouldn't it! New Civil Engineer magazine in its [July 2018 edition](#) advocates investment in supply infrastructure.

They are looking forward to the report of the National Infrastructure Commission on what the UK's priorities should be. They are critical of UK regulator Ofwat for focusing on leakage reduction and demand reduction through metering. On leakage they seem to be arguing that a lot has been done so it's not worth doing any more. On metering, they are probably right to say that water is inexpensive so accurate monthly bills are unlikely to result in significant reductions in usage.

Building capacity is an expensive and lazy answer to resilience. It assumes that capacity can accommodate all demand, however unreasonable, and all crises, however infrequent. It ignores the wastefulness of leakage.

Resilience is dealing with crises as best you can.

It would seem that this is the position of the UK regulator based on their recent report on the '[Beast from the East](#)', a spell of unusually cold weather.

The report mentions resilience in two contexts only: when talking about moving water to where it

is most needed – a nod to capacity, and in relation to 'resilience forums'. It leaves one with the impression that Ofwat's focus (or that of the report's author) seems to be on how to handle problems when they arise rather than preventing them.

Planning to deal with crises is good, but it would be better to plan in a way that ensured crises didn't arise, or at least arose much less often.

OUR SOLUTIONS

i2O provides network instrumentation, network monitoring and analytics, event management, and pressure optimisation solutions. One area in particular seems to us to be neglected: the opportunity to extend the period of time between recognising that a crisis is looming and the severity of its impact on customers. The main benefit is that it buys time.

Time in which supply can be improved, leakage detected and fixed, and rain can fall.

Our solutions have been used in Cape Town to push Day Zero from early in 2018 to an unspecified date in 2019.

This bought crucial time to accommodate a rebound in the level of customer demand, and to plan and implement additional supply. It avoided a crisis the likes of which the world has not yet seen: a major city running out of water.

You might think that a quick Google would throw up at least a dozen good resilience frameworks for water companies from regulators or water companies themselves. But no. Plenty of words have been written about resilience but there isn't much practical help.

So on the next page we offer up a serviceable template. We're not claiming that it's perfect, but we hope it can be put to use and improved.

RESILIENCE: PREVENTING AND PREPARING FOR THE WORST

WHAT PLANS ARE THERE TO ASSURE ADEQUATE SUPPLY FOR THE NEXT 25 YEARS?	CAN REAL LOSSES BE MINIMISED TO REDUCE THE SUPPLY NEED?	WHAT PLANS ARE THERE TO RECOVER FROM A MAJOR LOSS OF SUPPLY?
<ul style="list-style-type: none"> • Has a demand forecast been done? • Does it take account of population growth, urbanisation, demand levels and usage patterns? • Has a supply forecast been done? • Does it take account of extreme weather events, changes in customer demand? • How up-to-date is it? • Are there plans in place to re-zone to provide water to areas that are known to be high risk? 	<ul style="list-style-type: none"> • Are there leakage reduction targets in place? • Are these aggressive enough compared with global best practice? • Is a wide enough range of approaches being applied? • Do they cover burst reduction, background leakage reduction, leak detection and leak location as well as leak repair? • How efficient are the approaches in terms of cost, time and results? 	<ul style="list-style-type: none"> • Has a vulnerability assessment been conducted? • Has a business impact analysis been undertaken? • Are there plans for specific scenarios e.g. treatment plant failure, earthquake, flood/ tsunami, drought, extreme cold, deliberate poisoning, terrorist or enemy assault on infrastructure, etc.?
IS THERE APPROPRIATE INFORMATION AND OPERATIONAL TECHNOLOGY IN PLACE?		
<ul style="list-style-type: none"> • Is demand forecasting automated? 	<ul style="list-style-type: none"> • Is there a tool to prioritise expenditure? • Is there a tool to optimise pressure? • Is there a tool to identify and prioritise leaks? 	<ul style="list-style-type: none"> • Is there a tool in place to ensure timely and efficient information sharing?
ARE THERE CUSTOMER COMMUNICATION PLANS IN PLACE?		
<ul style="list-style-type: none"> • To build understanding of changes in demand, restrictions in extraction, etc. 	<ul style="list-style-type: none"> • To demonstrate efforts made to minimise waste 	<ul style="list-style-type: none"> • To demonstrate efforts to restore supply

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IS IT POSSIBLE TO BUY TIME BEFORE CUSTOMER RESTRICTIONS ARE NEEDED?	WHAT PLANS ARE IN PLACE TO RESTRICT CUSTOMER USAGE?	WHAT PLANS ARE THERE TO COPE IN EXTREMIS?
<ul style="list-style-type: none"> • What options are available to allow supply to be constrained in a way that didn't affect customers or affected them in a minimal way before restrictions on customers were put in place? • How practical and cost effective are those options? • Specifically, can pressure be regulated remotely, in small steps, accurately and smoothly to reduce open tap demand and constrain supply? 	<ul style="list-style-type: none"> • Is there a staged plan for the introduction of customer restrictions? • Are these reasonable and logical? • Are these specified by a regulator or chosen by the water company? • If chosen by the water company, how do they compare with global best practice? 	<ul style="list-style-type: none"> • Are there contingency plans in place to supply water in ways other than through the network? • How are these exercised to ensure that they will work?
IS THERE APPROPRIATE INFORMATION AND OPERATIONAL TECHNOLOGY IN PLACE?		
<ul style="list-style-type: none"> • Is advanced pressure management installed? 	<ul style="list-style-type: none"> • Is it possible to communicate directly as well as broadcast? 	<ul style="list-style-type: none"> • What tool is in place to ensure the coordination of the execution of contingency plans?
ARE THERE CUSTOMER COMMUNICATION PLANS IN PLACE?		
<ul style="list-style-type: none"> • To show that the last thing a water company wants is to affect customer service 	<ul style="list-style-type: none"> • To communicate stages, triggers and anticipated timings of restrictions 	<ul style="list-style-type: none"> • To communicate where, when and how alternative supplies will be provided

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